

LETTERS TO THE EDITOR.

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Further Notes on a recent Volcanic Island in the Pacific.

THE volcanic island—Falcon Island—in the Tonga group in the Pacific, of the recent appearance of which an account is given in NATURE, Vol. xli., p. 276, has recently been passed by a French vessel of war, the *Duchaffault*, which reports that the island is not now more than 25 feet high.

In October, 1889, when examined by Commander Oldham, it was 153 feet high, and a little over a mile long. Nearly entirely composed of ashes, it was rapidly washing away, and by the account above, it would seem that more than one-half the island must now have disappeared. W. J. L. WHARTON.

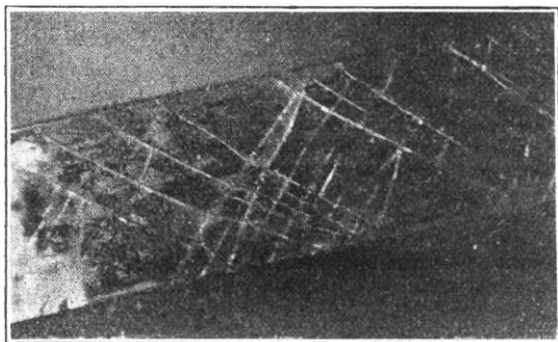
October 20.

Earth-fractures and Mars "Canals."

ON seeing the figure of the so-called "canals" of Mars, published in NATURE of a few weeks back, I was at once reminded of the pattern assumed by the cracks of glass broken by torsion, as in Daubrée's well-known geological experiment.

I enclose a photograph of part of a large slab of glass broken in this way in a class experiment of my own, and although other slabs, which have unfortunately not been preserved, exhibited, if I remember rightly, still more Martial-looking networks, I think that the general resemblance is obvious enough in this case.

It may perhaps be well to explain to non-geological readers of NATURE that Daubrée's glass-breaking¹ is regarded by many as reproducing in miniature the kind of fractures which are found to occur in those portions of the earth's crust with which we are acquainted, and that by torsion only has it proved possible to imitate the peculiar pattern assumed by such fractures, whether



they be joints or dislocations. It is further held by many that such lines of fracture in such patterns are a necessary result of the shrinking of the outer coat of a planet in course of cooling.

Mere fractures, such as we meet with in our own planet, could, of course, not be seen from any considerable distance, and if the circumstances of denudation were the same in Mars as with us, the "canals" could certainly not be the representatives of our usually hidden and featureless earth-cracks. There seems, however, to exist, in the extraordinarily rapid melting of gigantic ice-fields described by Prof. Norman Lockyer, some evidence of denuding power in Mars on a scale enormously larger than is the case with us. Earth-fractures—and for the matter of that Mars-fractures too—must many of them be lines of weakness along which denudation acts more freely than elsewhere, and if this denudation be phenomenal and cataclysmic, as appears to be likely in Mars, wide valleys or channels capable of being distinguished at great distances would soon be scoured out along them.

¹ Not "ice-breaking" as a mistranslation of the word "g'aze" has caused it to be described in some English text-books.

I would wish especially to draw attention to the three following points observable in the photograph, viz., the two marked directions in which the crack-lines run, one set crossing the others often at, or very nearly at, right angles; their occasional doubling and rough parallelism for some distance; and their frequent sudden stoppage—three of the features most noticeable in the Mars lines.

G. A. LEBOUR.

Durham Coll. Science, Newcastle, October 13.

A Wave of Wasp-Life.

MR. HUDSON's charming work on "The Naturalist in La Plata" reminds me of a very interesting wave of wasp-life which appeared in Wisconsin in the summer of 1886. We were living at the time in our summer-house at Pine Lake, and were making observations on the habits of the different animals in the neighbourhood.

In the latter part of July we suddenly found ourselves surrounded by large numbers of yellow-jackets and hornets. Everywhere through the woods and fields a veritable plague of wasps seemed to have descended upon the earth. During all the month of August we heard the same report from summer residents within a radius of twelve or fifteen miles of Pine Lake. In our immediate neighbourhood we knew of forty-seven nests. Allowing 1500 wasps to a nest—a very low estimate for that season of the year—this gave us over 70,000 wasps. Plates of meat and bones that were set outside for the cats were immediately covered with them, and in spite of screens in doors and windows they even entered the house, alighting on the food at the dinner-table, or darting about and catching flies.

The cause of this sudden increase in the number of wasps was evidently a general one, since it acted in the same way upon three species—*Vespa vidua*, *V. maculata* and *V. germanica*. An examination of the Signal Service statistics does not show anything unusual in the preceding winter and spring, but either the weather must have been especially favourable, lessening the ordinary death-rate of the queens, or there must have been a marked decrease in the parasites or other enemies which ordinarily keep these species in check.

The duration of the favourable conditions proved brief enough. It is probable that every one of our forty-seven nests furnished, at the very lowest estimate, one hundred developed and fertilized queens to start forty-seven hundred new nests in the following year; yet the increase in the checks to the too great ascendancy of these species more than counter-balanced the abnormal increase. The winter of 1886-87 was not especially severe, but in the following summer the most careful search on our part, and on the part of others, whose efforts were stimulated by the offer of rewards, only gave us four nests in our neighbourhood, and on all sides we were met by the inquiry: "What has become of the wasps?"

G. W. PECKHAM.

Milwaukee, Wisconsin, October 12.

Note on the Occurrence of a Freshwater Nemertine in England.

A FEW days after reading M. de Guerne's "History of Freshwater Nemerteans," published in the August number of the *Annals*, I happened upon a specimen of the group amongst the roots of some water plants, which I collected in the river Cherwell, close to Oxford. I was, at the time, searching for the cocoons of a new Rhinodrilid worm, of which a description will shortly appear. The gathered roots, with the cocoons, were placed in a bottle of water, in order that the worms might hatch out. On examining the bottle two days later, namely, on September 5, I noticed a small bright orange animal, about half an inch long when extended, creeping amongst the cocoons. Further observation with the microscope showed that it was a species of *Tetrastemma*. Unfortunately the animal was crushed before I had done more than sketch the general appearance and make some few observations, and I have not yet succeeded in finding more specimens; so that I am unable to state how far it agrees with or differs from the previously known freshwater forms enumerated by M. de Guerne, most of which are included by Silliman and later authors under the title *Tetrastemma aquarum dulcium*.

In one or two points, however, my sketches show certain differences from those of Silliman:—

(a) The colour (orange) is due to pigment in the skin, and not to the red colour of the nervous system; I may mention that Duges' species, "*Prostoma clepsinoides*," was yellow ochre, and "*Pr. lumbricoideum*" was yellow marbled with red; whilst Leidy's "*Eneia rubra*" was yellowish flesh-coloured (probably due to the hæmoglobin in the nervous system).

(b) The anterior pair of eye-spots is further from the prostomium than in Silliman's drawing; I found no third pair of eye-spots, which, however, it is stated, is absent in the young.

(c) The ciliated pits are further forward, being midway between the brain and the anterior end of the body.

(d) The proboscis and its retractor muscle are much more undulating, when withdrawn into the body, than Silliman shows.

The proboscoidal spine, with its groups of accessory spines, agrees very closely with the figures given by Silliman.

I can say nothing about the generative organs. For the present, then, I must leave undecided the specific name of this British *Tetrastemma*. W. BLAXLAND BENHAM.

Anatomical Department, Museum, Oxford,
Oct. 12.

Protective Mimicry.

MR. BATESON'S letter on "Aggressive Mimicry" (NATURE, October 20) recalls to my mind a curious case of protective mimicry which came under my notice last August on Dartmoor. Large patches of the heath had been burnt, a common practice on the moorlands to ensure a fresh young growth for the sheep. The whole ground was alive with a common species of orthoptera (*Locustina*), the small green grasshopper with short antennæ. They leapt aside at every step in the short grass and scrubby heath; upon the burnt patches they were equally numerous, but with this difference—all, without exception, were coal black on abdomen, thorax, and head, whilst the wings were of an ashen hue. So much did the colour adaptation resemble the blackened turf and heath they hopped amongst it was almost impossible to follow them with the eye; we made many amusing attempts, but were nearly always defeated. I measured one of these burnt patches, and found it to be from thirty to forty yards square. A yard or two from this, on the untouched herbage all the *Locustina* were bright green. I found one specimen on the borderland in a transition state, not dull all over as I had expected, but in spots and patches of bright green and black. One enemy at least of these insects abounded on the moor, namely, the common lizard (*Zootica vivipara*), for I have observed there is no food lizards will eat more greedily than grasshoppers. I have seen some that I have in captivity swallow twenty or thirty in two or three minutes, even after their usual meal of worms. They always became greatly excited, if one may apply so warm an expression to such cold-blooded animals, and rushed about the case when a collection of live grasshoppers were thrown to them. Certainly I was much struck by the rapid action of the power possessed by these *Locustina* on Dartmoor of assimilation to environment, and did not doubt but that this colour adaptation was for the purpose of protection, the eye producing by reflex action the change in the pigment cells. ROSE HAIG THOMAS.

STELLAR PARALLAX.¹

THE Delegates of the University Press have recently published the results of Prof. Pritchard's systematic investigations into the parallax of those stars of the second magnitude whose North declination permits the inquiry to be made with facility and advantage in these latitudes. Our first feeling on glancing over the contents of this brochure must be one of hearty congratulation to the distinguished professor that he has been permitted to see the full outcome of a protracted inquiry, conducted at a period in his life when a less energetic astronomer would have felt himself justified in withdrawing from active participation in scientific research.

¹ "Researches in Stellar Parallax by the aid of Photography." By Charles Pritchard, D.D., F.R.S., Savilian Professor of Astronomy in Oxford.

Prof. Pritchard might well have been content to rest on the laurels he had won, and to have staked his reputation upon that career of acknowledged utility which has marked his direction of the Oxford University Observatory.

Immediately on the completion of the photometrical examination of Argelander's *Uranometria*, and with a zeal that admitted of no delay, Professor Pritchard busied himself with this inquiry into the parallax of stars of the second magnitude. But if the inquiry was undertaken with eagerness, and pursued with ardour and resolution, it was not characterized by hurry, or its success imperilled by incompleteness. Confident himself that photographic methods possessed the requisite accuracy to make the research successful and trustworthy, the Savilian Professor set to work to establish the reliable character of measurements made on sensitized films, and not till that confidence was demonstrated did he embark upon the larger work now under notice. These preliminary inquiries have been published in a series of papers in the proceedings of the Royal and Royal Astronomical Societies, and the confidence gradually acquired by enlarged experience induced him to proceed with the determination of the parallax of 61 Cygni, the results of which are published in detail in the third fasciculus of the *Annals of the University Observatory*. In this case he selected four stars in the immediate neighbourhood of the principal star, and sought the difference of parallax between each of the components and of the four stars of comparison. This long research may be regarded by some as a work of supererogation, inasmuch as the labours of Bessel and that of many later astronomers have satisfactorily settled the parallax of this star within very approximate limits. But if we properly understand the motives of Prof. Pritchard, his intention was not so much to seek anew the parallax of that system, as to discover with what degree of accuracy the method of photography, hitherto unapplied in this direction, represented the work of others made directly in the field of the telescope. Nor was this his only view. By selecting four stars in the immediate neighbourhood of 61 Cygni and seeking the difference of parallax between these stars of comparison and each of the components of the system, he instituted a very severe inquiry as to the trustworthiness of that method, which he had imagined as capable of dealing with the delicate question of stellar parallax. The severity of the test consists in deducing the same value of the parallax (eight in all) from each set of measures, and as a matter of fact the accordance, *inter se* between these several determinations is as close as could have been anticipated, and likewise in satisfactory unison with the work of other astronomers.

The completeness of this inquiry and the publication of it in detail have had two happy results. In the first place, Prof. Pritchard has, in the present instance, been able to confine the printing within very narrow limits, so narrow, indeed, as possibly not to have done himself justice. The details of his process, the mutual agreement of his measures, and his method of discussion having all been fully set out in his previous work, he has not felt himself obliged to enter into these minute particulars, but has contented himself with presenting the results. This method of arrangement, no doubt suggested in the first place by economical motives, has afforded opportunity for adding a very interesting history of the processes and results that have hitherto been followed with more or less success by others, and also the exhibition in a concise form of the different values of the more trustworthy determinations, derived by previous observers. The second advantage, immediately arising from the earlier investigations, is, that an examination of those results has shown that no increase of accuracy (commensurate with the increased labour at